The Bologna Process: What Should And Should Not Be Done

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***Abstract* - The Bologna process aims to the construction of a European higher education area, with a system of easily readable and comparable degrees, promoting teachers and student's mobility in order to foster European citizen's employability and the international competitiveness of the European higher education system. It therefore presents an amazing opportunity to reshape academia curricula, particular in the case of engineering curriculum. In a knowledge-based economy, changing in a dramatic pace, new skills are needed. Skills like creative thinking, ecology insights, entrepreneurship, foreign languages learning, or even literature matter more than traditional core engineering issues. Unfortunately, some signs indicate that the Bologna process led only to a change in the length of the graduation cycles, which may become a lost opportunity to change our future into a sustainable and better one.**

Key Words – Bologna process, mobility, academia curricula, engineering

INTRODUCTION

The Bologna process is the political response to the challenges brought by information society and economic globalization. The Bologna process aims to the construction of a European higher education area in order to foster international competitiveness of the European higher education system. This process presents an extraordinary opportunity to change the higher education system into a new system in which the teacher is no longer the source of information, because he can no longer compete with the web data bases which possess thousands of articles that are renew in a very fast pace. The information source has been transferred from the teacher to the computer. Thus the teacher will be no longer an information supplier but instead a builder of learning plans, "the professor is no longer the sage on stage, he is the guide by the side" [1].

Graham Hill [1], in a conference about the Bologna process, states that the current education model is obsolete being currently replaced by a new model in which "skills replace knowledge as the primary objective of education". The new learning paradigm relies on the employability of the students and on the primacy of economic development. Torgal [2] quotes the English Secretary of State and Education and skills "the aim of this national skills strategy is to ensure that employers have the right skills to support the success of their business, and the individuals have the skills they need to be employable". Although such a trend is positive, because it brings new opportunities, it also brings some threats. The threat of shallowness in which the changes are just cosmetic. The threat of mass education without the proper quality in which the decrease in undergraduate time length is mainly due so that politics can lower the education budget. Or even the threat of reducing higher education systems into an appendix of corporate institutions.

THE BOLOGNA PROCESS

The so called Bologna Process has begun in May of 1998 [3], with the Sorbonne Declaration, but it was only in June of 1999 with the Bologna Declaration that it officially started [4]. The Bologna Declaration defines a set of stages and steps that must be taken by the European systems of higher education until the final of the present decade in order to build a European space of higher education globally harmonized. The basic idea is that any student of any higher education establishment could initiate is graduation, to continue its studies, to conclude its higher education and to get an European diploma in any University of any member state of the European Union. In order to make that happen it needs that higher education system working together in an open space ruled by education mechanisms and acknowledgement of academic degrees. In the last run, the Bologna Process will lead to a generalized harmonization of the educative structures, which assure the higher education in a Europe of currently 45 countries. The analysis of the Bologna Declaration states a political agreement that can be summarized as follows:

- Adoption of a system of easily readable and comparable degrees, also through the implementation of the Diploma Supplement, in order to promote European citizens employability and the international competitiveness of the European higher education system.
- Adoption of a system essentially based on two main cycles, undergraduate and graduate. Access to the second cycle shall require successful completion of first cycle studies, lasting a minimum of three years. The degree awarded after the first cycle shall also be relevant to the European labour market as an appropriate level of qualification. The second cycle should lead to the master and/or doctorate degree as in many European countries.
- Establishment of a system of credits - such as in the ECTS system – as a proper means of promoting the most widespread student mobility. Credits could also be acquired in non-higher education contexts, including lifelong learning, provided they are recognized by receiving Universities concerned.
- Promotion of mobility by overcoming obstacles to the effective exercise of free movement with particular attention to: students access to study and training opportunities and to related services for teachers, researchers and administrative staff recognition and valorisation of periods spent in a European context researching, teaching and training, without prejudicing their statutory rights.
- Promotion of European co-operation in quality assurance in order to develop comparable criteria and methodologies.
- Promotion of the necessary European dimensions in higher education, particularly with regard to curricular development, interinstitutional co-operation, mobility schemes and integrated programmes of study, training and research.

Two years later on 29 of March of 2001, more than three hundred institutions of the European higher education system gathered in Salamanca [5], giving their support to the principles of the Bologna Declaration. In 18 of May of the same year the Ministers responsible for the Higher Education gathered in Prague [6]. The Ministers reaffirmed their commitment to the Bologna Process and welcomed the involvement of a number of new actors: the European University Association (EUA); National Union of Students in Europe (ESIB); European Association of Institutions in Higher Education (EURASHE); the European Commission. By the time of the Prague summit, the number of signatory countries to the Process had grown from the original 29 to 33. Ministers also agreed on three new action lines to add to the six set down in Bologna:

- A focus on lifelong learning
- The inclusion of higher education institutions and students in the process
- A promotion of the attractiveness of the European Higher Education Area

In September of 2003, Ministers responsible for the Higher Education of 33 European countries gathered in Berlin [7]. They reaffirmed the goals set in Bologna and Prague meetings having added two more:

- The need to promote closer bonds between the European Higher Education Area and the the European Research Area, in order to fortify Europe research capacity, improving the quality and the attraction of European Higher Education.

- Widening the current system of two cycles, to include a PhD cycle in the Bologna Process, and to increase PhD mobility as well as post-PhD mobility. The institutions must increase their cooperation at the level of PhD studies and also young researcher's education.

In the Bergen meeting [8], that was held in May of 2005, the Ministers of the 45 countries which participate in the Bologna Process have reaffirmed the importance of the Berlin goals about the need of closer bonds between the European Higher Education Area and the European Research Area and about PhD studies.

THE CASE OF PORTUGAL

Even before the Bologna Process started, the higher education system across Europe was already in the model Bachelor /Master, (with some little differences about the cycle length, from one country to another). However, in Portugal the Universities only had long length cycles (5 years-"licenciatura") and the Polytechnic Institutions had two cycles, a short one (3 years – bachelor degree) that later became a long one (3+2 – "licenciatura" degree). In this country the discussion about the changes brought by the Bologna Process as begun very late, and for a long time that was just it, more and more discussion. One must note that already the Romans said about the inhabitants of the Lusitania that " they do not govern themselves nor let anyone to govern them". Perhaps with this, the Romans wanted to explain why they had taken more than two hundred years to pacify the Lusitania, when only 7 years had been enough to conquer the Gallia. It was only on 24 of March of 2006 that the Higher Education Act which approves the new academia degrees passed [9]. One year later only 50% of all curricula have been changed according to the Bologna Process [10]. The new law allows the Higher Education Institutions to choose the length of cycles, 3+2, 4+1 or even 5+0 (Master degree), although the latter is in fact a subterfuge of the Bologna Process which states that a Professional competence must be acquired after a short education cycle. Unfortunately, some evidence points out that the new curriculum under the Bologna Process is just the old one, cut in two education cycles. So the discussion about the Bologna process is centered in two main subjects. The first issue is the fact that the short cycle graduation which is called "licenciatura" degree instead of "Bachelor degree" may confuse the employers and also the general population. And the second issue, the main one, being

funding related. Since the Portuguese Government may only give Higher Education Institutions the funds to pay for the short graduation cycles, with the exception of the professions that have been under specific European Union Acts, such as the case of doctors, nurses responsible for general cares, dentists, veterinarians, obstetrics and the architects.

The current scene has much to do with institutions incapacity to free themselves of intrinsic restraints due to internal power balances. Change implies that settled interests are removed. That is not easy from within and not possible from the outside either, due to academic freedom. That is why the Portuguese Government seems to want to impose a change from the outside, raising the possibility of the formation of an entity for the "orientation and regulation of the Higher Education system whose deliberations could be mandatory, with representatives of the government, the companies, science and the culture, the civil society, to articulate the interests of the Higher Education with the national priorities" or even changing the traditional rules of election of the Higher Education Deans, gathering conditions so that the process could be " open to teachers from other institutions" [10].

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ENGINEERING EDUCATION IN THE 21ST CENTURY

Reshaping the Portuguese Higher Education graduations implies that we answer the question: what is the purpose of the Higher Education system? Since the Higher Education system is fed by all tax payers, it is no surprise that people in general expect that the use of their money is well spent, so one of the duties of the Higher Education institutions is to the education of the population. Another duty is related to the "pursuit of truth", in fact the "Universities core business", here we have the research that has immediate purposes and leads to economic development and the "knowledge for the knowledge´s sake" with no purpose in the short run. Indeed Higher Education institutions must use the money that tax payers lend them on education and on applied research. However, universities cannot be reduced to an appendix of economic development, they have a higher duty to mankind, and that is the real truth. But what is the real truth? Well, in the last run the real truth has to do with the survival of mankind and that may be opposite to economic development. In fact, the current economic development model is a true enemy of mankind, because it is responsible for the conditions that could lead to is termination.

As Ford [11] states, "the world is on the verge of an ecological catastrophe…virtually unimaginable in its scope…modern university should abandon its attachment to philosophical materialism and economism-the faith that infinite economic growth is possible and desirable…higher education should provide students an awareness of the value of all things in nature…". In the period of time between 1900 and 2000, while global population increased 4 times, the industrial production increased 40 times, the carbon dioxide emissions increased 16 times and the area covered by forests is now 0,8 the size it was in the year 1900. And that is not only an environmental problem as Stern [12] reported. If we act now the cost of all the services and products to combat climate change will be 1% GDP, otherwise a economic depression of about 20% GDP may take place. Even the United Nations [13] recognize the urge of that problem, having declared the years 2005–2014 as a decade of promoting education for sustainable development. The common goal of the UN and its member states is that the principles of sustainable development are incorporated in the national curricula of the whole education system. Therefore, Portuguese Higher Education Institutions should take the amazing opportunity that was raised by the Bologna Process to start a revolution, reshaping its mission around sustainable development. Engineering education in particular, (engineers are the class of people who contribute most, and most directly, to the changing face of the earth [14]), should abandon the traditional technical specialization which is in the base of the current economic development model, being more part of the problem than of the solution. As Zielinski [15] put it "the traditional narrow technical formation produces graduates that are, using the German language expression "fachidiot". Therefore, he believes that we must reform university curricula to provide the integration of technical science, economics and humanistic knowledge about man". New skills like creative thinking, ecology insights, entrepreneurship, foreign languages learning, communication or even humanities and literature matter most than traditional core engineering issues. "Creative thinking can facilitate an innovative and proactive approach and help students to think holistically and consider the long term consequences when making decisions and solving problems" [16]. Entrepreneurship as a way to foster a new attitude in the future engineers, a more independent and responsible one [2] and that may lead to the development of "start-up businesses, the motor propelling the development of the new economies". Communication and language learning, so the future engineer can "act as citizen of the world" [17], realizing his place in the global economy. The need for humanities in technical curricula can be explained in part by the impact technology has on our society [18]. As Dator [19] put it "engineering is not more important than ethics. Science is not more important than policy and law." Monk [20] states that it is literature, especially in the form of novel and tragedy, which highlights how people cope with ethical dilemmas. A new kind of engineering education is therefore needed, an education that may give the future engineers the skills to act globally in a conscious and humanistic manner putting people first, not technology that is what Bologna process should be used for.

CONCLUSIONS

The Bologna Process is a political option that promotes students and teachers mobility by overcoming obstacles to the effective exercise of free movement and foster European citizens employability and the international competitiveness of the European higher education system.

Unfortunately Portuguese Higher Education had spent a lot of time discussing small issues related to the length of education cycles. Instead, they should take the opportunity that was raised by the Bologna Process to start a revolution, reshaping its mission around sustainable development.

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